

WHAT IS CLAIMED IS:

1 *sub D* 1. A cell transduction vector comprising a vector nucleic acid
2 encoding:

3 a retroviral packaging site;
4 a first viral inhibitor subsequence;
5 a splice donor site subsequence;
6 a splice acceptor site subsequence;
7 a retroviral Rev binding subsequence; and,
8 a promoter subsequence;

9 wherein:

10 the first viral inhibitor subsequence is located between the splice donor site
11 subsequence and the splice acceptor site subsequence;

12 the splice donor site subsequence and the splice acceptor site subsequence
13 permit splicing of the first viral inhibitor subsequence from the vector nucleic acid in
14 the nucleus of a cell; and,

15 the promoter subsequence is operably linked to the first viral inhibitor
16 subsequence.

1 2. The cell transduction vector of claim 1, wherein the vector
2 nucleic acid further encodes a retroviral Rev binding subsequence, wherein the vector
3 nucleic acid is translocated to the cytoplasm in the presence of a Rev protein, and
4 wherein splicing of the first viral inhibitor sequence is inhibited by Rev.

1 3. The cell transduction vector of claim 2, wherein the retroviral
2 Rev binding subsequence is an HIV/RRE sequence.

1 4. The cell transduction vector of claim 1, wherein the first viral
2 inhibitor comprises a nucleic acid subsequence encoding a ribonuclease selected from
3 the pancreatic RNase A superfamily.

1 5. The cell transduction vector of claim 1, wherein the first viral
2 inhibitor comprises a nucleic acid subsequence encoding a ribonuclease selected from

the group of ribonucleases consisting of Onconase, modified Onconase, and EDN.

6. The cell transduction vector of claim 1, wherein the first viral inhibitor subsequence encodes a transdominant protein selected from the group of transdominant proteins consisting of transdominant Gag, transdominant Tat, and transdominant Rev.

7. The cell transduction vector of claim 1, wherein the vector further comprises a cell binding ligand selected from the group consisting of transferrin, *c-kit* ligand, an interleukin and a cytokine.

8. The cell transduction vector of claim 1, wherein the promoter is selected from the group of promoters consisting of a retroviral LTR promoter, a constitutive promoter, an inducible promoter, a tissue specific promoter, a CMV promoter, a probasin promoter and a tetracycline-responsive promoter.

9. The cell transduction vector of claim 1, wherein the vector further comprises an encephalomyocarditis virus internal ribosome entry site (IRES).

10. The cell transduction vector of claim 1, wherein the vector nucleic acid further encodes a second viral inhibitor.

11. The cell transduction vector of claim 9, wherein the vector nucleic acid further encodes a second viral inhibitor, wherein transcription of the second nucleic acid is controlled by the IRES.

12. The cell transduction vector of claim 1, wherein vector nucleic acid further encodes a multicistronic mRNA with a first open reading frame and a second open reading frame, which multicistronic mRNA comprises an IRES sequence which directs translation of the second open reading frame in a cell.

1 13. The cell transduction vector of claim 11, wherein the first open
2 reading frame encodes a viral inhibitor.

1 *sub D2* 14. The cell transduction vector of claim 1, wherein the vector
2 comprises a retroviral particle.

1 15. The cell transduction vector of claim 1, wherein the vector
2 nucleic acid is packaged into an HIV particle in a cell infected by a wild-type HIV.

1 16. The cell transduction vector of claim 1, wherein the vector
2 nucleic acid is packaged in a liposome.

1 *sub D3* 17. The cell transduction vector of claim 14, wherein the retroviral
2 particle is pseudotyped for transduction into hematopoietic stem cells.

1 18. The cell transduction vector of claim 1, wherein the vector further
2 comprises a pharmaceutical excipient.

1 19. The cell transduction vector of claim 1, wherein the vector
2 nucleic acid further encodes a reporter gene.

1 *sub D4* 20. The cell transduction vector of claim 1, wherein the cell
2 transduction vector is selected from the group of cell transduction vectors consisting of
3 pBAR, pBAR-ONC, pBAR-EDN and conservative modifications thereof.

1 21. The cell transduction vector of claim 1, wherein the viral inhibitor
2 is an oncogene inhibitor.

3 22. The cell transduction vector of claim 1, wherein the vector further
4 comprises an oncogene inhibitor.

1 23. The cell transduction vector of claim 22, wherein the oncogene

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inhibitor is a nucleic acid encoding an inhibitor selected from the group of inhibitors consisting of a antibody which specifically binds a Ras protein and an RNase.

24. The cell transduction vector of claim 22, wherein the oncogene inhibitor is an RNase from the RNase A superfamily.

25. A cell transduction vector comprising a nucleic acid subsequence encoding an EDN protein, which subsequence is operably linked to a promoter, wherein said cell transduction vector inhibits the replication of a retrovirus in a cell transduced by the cell transduction vector.

Sub D5
26. The cell transduction vector of claim 25, wherein the vector is pBAR-EDN, or a conservative modification thereof.

27. The cell transduction vector of claim 25, wherein the cell is a CD4⁺ cell.

28. The cell transduction vector of claim 25, wherein the cell is a stem cell.

29. The cell transduction vector of claim 25, wherein the vector inhibits the replication of HIV in the cell.

30. The cell transduction vector of claim 25, wherein the vector nucleic acid is packaged in a retroviral particle.

31. The cell transduction vector of claim 25, wherein the vector is packaged in a liposome.

32. The cell transduction vector of claim 25, wherein the vector comprises a cell binding ligand selected from the group of cell binding ligands consisting of transferrin, *kit*-ligand, an interleukin, and a cytokine.

1 33. The cell transduction vector of claim 25, wherein the vector
2 nucleic acid further encodes a subsequence encoding a retroviral chromosome
3 integration subsequence.

4 *Sub E1* 34. The cell transduction vector of claim 25, wherein the vector
5 further comprises a multicistronic mRNA which encodes a first open reading frame and
6 a second open reading frame, which multicistronic mRNA is operably linked to a
7 promoter, wherein the multicistronic mRNA comprises a subsequence encoding EDN.

1 35. The cell transduction vector of claim 25, wherein the promoter is
2 selected from the group consisting of a tetracycline responsive promoter, a probasin
3 promoter, and a CMV promoter.

1 36. A method of transducing a cell with a nucleic acid encoding a
2 viral inhibitor comprising contacting the cell with the cell transduction vector of claim
3 1.

1 *Sub A2* 37. The method of claim 36, wherein the cell is transduced *in vitro*.

1 38. A method of inhibiting the growth of HIV in a cell comprising
2 transducing the cell with the cell transduction vector of claim 1.

1 39. The method of claim 38, wherein the cell is isolated from a
2 mammal, and wherein the method further comprises introducing the cell into a
3 mammal.

1 *Sub A3* 40. The method of claim 39, wherein the cell is selected from the
2 group of cells consisting of transferrin receptor⁺ cells, CD4⁺ cells and CD34⁺
3 hematopoietic stem cells.

1 *Sub E1* 41. A cell comprising the cell transduction vector of claim 1.

1 42. The cell of claim 41, wherein the cell is selected from the group
2 of cells comprising CD4⁺ cells, CD34⁺ hematopoietic stem cells, and transferrin
3 receptor⁺ cells.

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